

CLAIMS

What is claimed is:

1. An electroluminescence display device comprising:
a substrate;
a corrugated structure formed on the substrate, wherein the corrugated structure disperses light through diffraction and reflection; and
a first electrode layer, a first insulation layer, a fluorescent layer, a second insulation layer, and a second electrode layer sequentially formed on the substrate to follow the shape of the corrugated structure.
2. The electroluminescence display device of claim 1, wherein the corrugated structure comprises a plurality of dots having a cylindrical shape or a polygonal cone shape, and arranged in a predetermined pitch.
3. The electroluminescence display device of claim 1, wherein the corrugated structure comprises a thin-film layer having a plurality of holes formed in a predetermined pattern.
4. The electroluminescence display device of claim 1, wherein the corrugated structure comprises a material having substantially the same refractive index as the substrate.
5. The electroluminescence display device of claim 4, wherein the material comprises SiO₂, SiO₂ aerogel, silicon polymer, BCB, or polyimide.
6. The electroluminescence display device of claim 1, wherein a pitch between corrugating members of the corrugated structure is $\lambda/4$ to 4λ of a wavelength of light produced from the fluorescent layer.
7. The electroluminescence display device of claim 6, wherein the pitch between corrugating members of the corrugated structure is 100-2400 nm.

8. The electroluminescence display device of claim 1, wherein a height of corrugating members of the corrugated structure is 50-1000 nm.
9. The electroluminescence display device of claim 2, wherein the shape of a top surface of each dot is a circle, and a relationship between a diameter of the circle and a pitch between the dots satisfies a formula of $0.05 < 2 \times D/P < 0.5$, wherein D and P represent the diameter and pitch, respectively.
10. The electroluminescence display device of claim 1, wherein the fluorescent layer has a higher refractive index than the adjacent first and second insulation layers.
11. The electroluminescence display device of claim 1, wherein the fluorescent layer comprises an oxide or sulfide having a refractive index of more than 1.6 as a base material.
12. An electroluminescence display device comprising:
a transparent substrate;
a corrugated structure dispersing light through diffraction and reflection; and
a first electrode layer, a first insulation layer, a fluorescent layer, a second insulation layer, and a second electrode layer sequentially formed on the substrate,
wherein the corrugated structure is formed on the substrate or on at least one of the sequentially formed layers, and at least one of the sequentially formed layers is formed on the corrugated structure to follow a shape of the corrugated structure.
13. The electroluminescence display device of claim 12, wherein the corrugated structure comprises a plurality of dots having a cylindrical shape or a polygonal cone shape, and arranged in a predetermined pitch.
14. The electroluminescence display device of claim 12, wherein the corrugated structure comprises transparent SiO_2 or polyimide.
15. The electroluminescence display device of claim 12, wherein a predetermined pitch between corrugating members of the corrugated structure is $\lambda/4$ to 4λ of a wavelength of light produced from the fluorescent layer.

16. The electroluminescence display device of claim 15, wherein the predetermined pitch is 100-2400 nm.

17. The electroluminescence display device of claim 12, wherein a height of corrugating members of the corrugated structure is 50-1000 nm.

18. The electroluminescence display device of claim 13, wherein the shape of a top surface of each dot is a circle, and a relationship between a diameter of the circle and a pitch between the dots satisfies a formula of $0.05 < 2 \times D/P < 0.5$, wherein D and P represent the diameter and pitch, respectively.

19. The electroluminescence display device of claim 12, wherein the fluorescent layer has a higher refractive index than adjacent layers.

20. The electroluminescence display device of claim 12, wherein the fluorescent layer comprises an oxide or sulfide having a refractive index of more than 1.6 as a base material.

21. The electroluminescence display device of claim 12, further comprising a thin film transistor layer driving the first electrode layer and the second electrode layer.

22. The electroluminescence display device of claim 12, wherein the fluorescent layer comprises red, green, and blue layers formed in a predetermined pattern, and is formed between the first electrode layer and the second electrode layer, the first and second electrode layers also formed in a predetermined pattern.

23. A method of manufacturing an electroluminescence display device, the method comprising:

- preparing a transparent substrate;
- forming an insulation thin-film layer on the transparent substrate;
- forming a photoresist layer on the insulation thin-film layer;
- patterning the photoresist layer using a laser hologram;
- etching the patterned photoresist layer; and

etching the insulation thin-film layer using the etched photoresist layer, thereby forming a corrugated structure which disperses light through diffraction and reflection.